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ENVIRONMENTAL

Subject:
Ecological Risk Assessment
0316510002--Cook County
Wisconsin Steel Works/Chicago
ARCADIS Geraghty & Miller Project No. C1000664.0003.00012

Chicago,
19 June 2000

Contact:
Gregory A. Vancierlaan

Dear Mr. Gross:

The Illinois Environmental Protection Agency's (Illinois EPA) Office of Chemical Safety provided comments (dated February 15, 2000) on the report entitled *Ecological Risk Assessment, Former Wisconsin Steel Works, Navistar International Transportation Corp., Chicago, Illinois (December 1999)*. Before responding to each comment, the following summary is provided so as to clarify the purpose of report preparation.

Extension:
(312) 425-4120

The Ecological Risk Assessment was prepared on a voluntary basis and is neither a requirement of the Consent Order nor the work plan for the Phase II Remedial Investigation for the Former Wisconsin Steel Works (WSW) site. Additionally, the north and south barge slips are not part of the land trust, and therefore the No Further Remediation (NFR) letters being pursued for the site will not address the slips.

The Ecological Risk Assessment was prepared in response to a request from the Center for Neighborhood Technology (CNT) for International Truck and Engine Corporation (International) to dredge the slips. Over the past 18 months we have met with CNT and other community members to discuss various aspects of our work and their expressed interest in dredging the barge slips adjacent to the WSW site. We have been clear that International's priority is to complete the work on the trust property so it can be redeveloped. With regard to dredging we have also been clear that: (1) given the slip sediment conditions as characterized by the government there is no need to dredge; (2) if the sediments need to be addressed, dredging may not be the most cost effective alternative; and (3) if it is determined more work needs to be done on the slip sediments, International would cooperate with Illinois EPA and

other potentially responsible parties in furthering such an endeavor, ideally after completing work on the WSW site property.

Specifically with regard to item 1 above, the Ecological Risk Assessment was prepared to document our position expressly for the community. It was provided to the Illinois EPA for informational purposes and not for comment and approval. The Ecological Risk Assessment is not a draft document, as stated by the Illinois EPA in its comment letter (as noted above, we respond to your comments below). We do not have plans to revise and reissue the document. The document represents ARCADIS Geraghty & Miller's considered evaluation of the conditions of the slips based on data collected by the U.S. Fish and Wildlife Service and the Illinois EPA. The intent of the report was to provide the community with our evaluation of slip sediment conditions using the existing data, which ARCADIS Geraghty & Miller believes is adequate to assess ecological conditions.

The comments expressed by Illinois EPA do not significantly alter the main conclusion of the report: there is no imminent hazard to aquatic or bird communities utilizing the barge slips. Thus, no intrusive actions are warranted.

Responses to the IEPA comments are provided below.

- 1. **Page 2/20: Bullet 4:** It is stated on page 2/20 that fish were collected from the two slips; however, it appears from review of Table 7 that fish samples were only reported for the south slip. Upon review of the U.S. Fish and Wildlife Service (USFWS) study from 1994, it is noted that some of the inorganics were higher in white perch taken from the north slip (e.g., chromium and zinc). Table 7 should include **all** of the data generated on fish tissue results for **both** slips.*

Response: The only ecological receptors that could prey upon the fish collected by U.S. Fish and Wildlife Service are large wading birds (e.g., great blue heron). Only south slip fish sample data were presented in Table 7 because no suitable foraging habitat for large wading birds exists in the north slip. While white perch samples collected from the north slip contain slightly higher concentrations of chromium and zinc, assessing risk with those concentrations would not significantly change the results of the risk assessment. However, risk was not assessed with fish tissue data from the north slip for the reasons stated above.

- 2. Page 4/20: Section 2.3.3 Sediment Toxicity Tests:** *The toxicity testing of the sediment conducted by the USFWS only included the evaluation of toxicity to fathead minnows. Although this information is important, these results alone do not provide sufficient characterization of the potential toxicity of the sediment to aquatic biota. Conducting toxicity testing using organisms which are in direct contact with the sediment, such as Chironomus tentans or Hyalella azteca, would provide more compelling evidence relative to the toxicity of the sediments.*

Response: Again, we believe the existing data base is entirely adequate on which to base this ecological assessment. The U.S. Fish and Wildlife Service conducted 20 whole-sediment toxicity tests. Significant toxicity was observed in only 2 samples. The observed toxicity was associated with high levels of naturally occurring ammonia. In addition, the prevalence of fine-grain sediments limits the types of benthic organisms that could be present. The depositional habitat in the barge slips is not suitable habitat for *Hyalella azteca* (ASTM, 1994).

- 3. Page 6/20: Section 2.7: Chemicals of Potential Ecological Concern:** *Initial screening of the sediments was conducted by comparing the mean concentrations of sediment constituents to regional background concentrations. These "regional" background data were obtained from the IEPA's Evaluation of Stream Sediment Data 1974-1980 and a 1987 USGS publication. First, the use of mean concentrations alone is not acceptable. The upper confidence limit (95% UCL) should be calculated and used for comparison purpose. Second, the IEPA publication that was used has been superseded by an August 1997 document entitled Evaluation of Illinois Sieved Stream Sediment Data 1982-1995 (IEPA/BOW/97-016). Thirdly, Illinois EPA does not agree with the use of the IEPA "elevated classification," nor the use of the USGS 90th percentile metal concentrations as the basis of the regional background data set. For screening purposes, Illinois EPA uses the IEPA "non elevated" classification for evaluating site data. In addition, although Illinois EPA prefers the IEPA stream sediment data, the USGS data can also be used for comparison purposes if the 50th percentile is cited instead of the 95th percentile.*

Response: It is not appropriate and not a valid statistical procedure to compare the maximum site concentration to a mean background concentration. Even within a background location, the maximum concentration exceeds the mean. Thus, maximum site concentrations would be expected to exceed mean background concentrations even for constituents that are not present at elevated concentrations. Maximum site concentrations should only be compared to a reasonable estimate of maximum background concentrations, and mean site concentrations should be compared to a reasonable estimate of mean background concentrations.

- 4. Page 7/20: Section 2.7.1: Sediment COCs:** *The sediment concentrations were screened against only one ecological benchmark, the ARCS Effects Range Median for Hyalella azteca. For screening purposes, IEPA supports the use of multiple benchmarks in order to provide for a robust evaluation of the site data. This evaluation should include, but is not limited to, the USEPA sediment quality criteria, Ontario Ministry of Environment and Energy sediment benchmarks, NOAA benchmarks, and Oak Ridge National Laboratory sediment benchmarks.*

Response: Among the sources of benchmarks listed in this comment, the ARCS, Ontario, and NOAA benchmarks are all based on empirical associations between chemical concentrations and biological effects in field-collected sediments. Benchmarks should be used only for screening purposes, because they do not reflect cause-effect relationships between chemical concentrations and toxicity. The ARCS benchmarks are most applicable based on the geographic area represented in the underlying data set (i.e., Great Lakes sediment quality). Beyond benchmark screening, the ΣPAH model (see response to Comment 7) and site-specific toxicity tests were also used to provide a site-specific evaluation of sediment quality in the barge slips.

- 5. Page 7/20: Section 2.7.2: Sediment COCs:** *As previously mentioned for the background screening, the comparison of ecological benchmarks should also be conducted using the 95%UCL of the site data. In the event that insufficient data are available for the calculation of the 95%UCL, the maximum concentration may be utilized.*

Response: The use of average chemical concentrations taken directly from sediment chemical analyses provides the most likely estimate of site-specific ecological risks.

- 6. Page 8/20: Section 2.7.1: Sediment COCs:** *ARCADIS states on page 8/20 that pesticides were not considered in the ecological assessment because they "were not detected at substantially elevated concentrations or at significant frequency on the WSW site." The pesticides should be carried through the screening stage of the assessment using the sediment benchmarks previously identified by Illinois EPA.*

Response: Pesticide-related risks to fish and wildlife appear to be insignificant, based on the lack of detectable pesticide concentrations in fish collected from the barge slips. Given the historical use of the site as a steel manufacturing facility, pesticides detected in barge slip sediments originated from other sources.

7. Page 11/20: Section 3.1.2: Toxicity Analysis for Aquatic Organisms:

ARCADIS should use the most recent Swartz paper describing sediment guidelines for PAHs (Swartz, R.C. 1999. Consensus sediment quality guidelines for polycyclic aromatic hydrocarbon mixtures. Environmental Toxicology and Chemistry, Vol. 18, No. 4 pp. 780-787). This paper considers several approaches for evaluating total PAHs in sediment and presents "consensus" values for screening.

Response: Swartz (1999) provides three screening-level sediment quality guidelines for total PAHs: a threshold effect concentration of 290 µg/gOC, a median effect concentration of 1,800 µg/gOC, and an extreme effect concentration of 10,000 µg/gOC. These screening-level guidelines are intended to be consistent with the Σ PAH model developed by Swartz et al. (1995) and with empirical data, but are easier to apply than the ΣPAH model. The Swartz (1999) guidelines in no way supersede Σ PAH model. Rather, the ΣPAH model is used to provide a more site-specific assessment of sediment quality which accounts for differences in the bioavailability and toxicity of specific PAH compounds.

8. Page 13/20: Section 3.1.3: Toxicity Test Results Evaluation: *ARCADIS states on page 13/20 that the Illinois EPA has not published or promulgated water quality criteria for the PAHs. Although criteria have not been published or promulgated, the IEPA Bureau of Water has developed water quality criteria for a number of PAHs under 35 IAC Section 302.210. ARCADIS should contact Clark Olson with the IEPAs Bureau of Water for further information on the criteria that have been developed for individual PAHs.*

Response: Criteria developed under 35 IAC Section 302.210 are presented in Table 12 of the risk assessment.

9. Page 15/20: Section 3.2: Analysis of Risks to Piscivorous Birds: *The evaluation of potential impacts on piscivorous birds was limited to the evaluation of the great blue heron. Because of the site-specific nature of the shoreline in the slips (i.e., sheer walls), only 500 square feet of foraging area was assumed for the great blue heron due to its wading nature when feeding. The Illinois EPA suggests that a diving bird, such as the belted kingfisher, be evaluated in the ecological assessment. Kingfishers, whose diets consist mainly of fish, were observed in the north slip during the 1993 inventory conducted by USFWS.*

Response: As stated in response to Comment #1, the only relevant ecological receptors that could prey upon the types of fish collected by U.S. Fish and Wildlife Service are large wading birds. Thus, the ecological assessment considered great

blue heron. The limited extent of clear, shallow water, the lack of riparian habitat, and the occurrence of human disturbance are expected to limit use of the barge slips by kingfishers (Prose, 1985). Also, kingfishers consume small fish (generally less than 15 cm; USEPA, 1993), which tend to contain lower concentrations of bioaccumulative chemicals than larger fish. Thus, the data collected by USFWS for carp and white perch are not appropriate to evaluate exposure by belted kingfishers.

10. Page 16/20: Section 3.2.2: Toxicity Reference Values: *ARCADIS notes on page 16/20 that they used Toxicity Reference Values (TRVs) developed by the USEPA BTAG for U.S. Navy Clean sites in the United States. ARCADIS should submit a copy of these TRVs, along with details of their derivation, to the Illinois EPA for review.*

Response: The avian TRVs were obtained from Region IX USEPA. Questions about the Navy BTAG TRVs should be directed to:

Clarence Calahan
USEPA Region IX BTAG
(415) 744-2314

11. Page 16/20: Section 3.2.3: Dose Estimation: *The only chemicals of concern that were evaluated in the fish ingestion scenario were those detected in the fish tissue analysis conducted by USFWS. Due to the limited nature of the fish tissue analysis, the Illinois EPA recommends that a modeling exercise also be conducted in order to evaluate the potential for the uptake of sediment contaminants into aquatic organisms and subsequent consumption by piscivorous birds.*

Response: Measured chemical concentrations in fish provide a more accurate estimate of avian exposures than would modeled chemical concentrations. Modeling is particularly uncertain for PAHs (which are metabolized by fish) and metals (which are bioaccumulated by aquatic organisms). All potentially bioaccumulative chemicals that were detected in sediments were also analyzed in fish tissue. Thus, the chemical analyses of fish tissue samples should not be identified as a limitation of the USFWS data.

12. Page 20/20: Section 7.0: References: *The reference section is incomplete. The Illinois EPA noted a number of citations in the text that are not listed in the reference section of the document.*

Response: An updated reference section is enclosed.

13. Table 3: *The footnote (a) in Table 3 states that dry weight concentrations were normalized using the "...average total organic carbon concentrations*

when no data were available." Specific details are needed on the sample locations and analytical results used in determining the site-specific organic carbon concentrations.

Response: Sample-specific and average total organic carbon (TOC) concentrations are as follows:

Sample Location	TOC (mg/kg)
<i>South Slip Samples</i>	
WSW-5A+B	57200
WSW-6A+B	55300
WSW-11A+B	46000
WSW-12A+B	44800
South Slip Average	50825
<i>North Slip Samples</i>	
WSW-1A+B	38100
WSW-2A+B	35300
WSW-3A+B	38900
WSW-4A+B	45700
WSW-9A+B	49700
WSW-10A+B	49500
North Slip Average	42867

14. Table 8: *There appear to be at least two errors in Table 8. The 90th percentile data for arsenic and barium from the USGS NAWQAP, should be 17 mg/kg and 540 mg/kg, respectively (not 12 mg/kg and 460 mg/kg as listed in Table 8).*

Response: We concur with the corrections described in this comment.

References for Comment Responses

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Prose, B.L. 1985. Habitat Suitability Index Models: Belted Kingfisher. U.S. Fish & Wildlife Service Biological Report 82(10.87).

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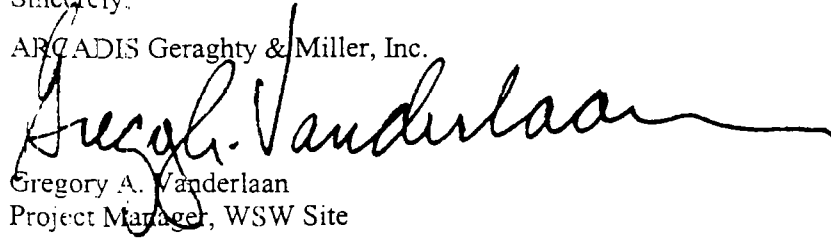
ARCADIS GERAGHTY & MILLER

Mr. Todd Gross
19 June 2000

If you have any questions about the purpose or content of this letter, please do not hesitate to contact me.

Sincerely,

ARCADIS Geraghty & Miller, Inc.

A handwritten signature in black ink, reading "Gregory A. Vanderlaan". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Gregory A. Vanderlaan
Project Manager, WSW Site

Enclosure: Updated References Section

Copies

Edith Ardiente, International

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